Space Weather Forecast

Issued on Tuesday 10 December 2024 at 01:23 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate class flares with a Slight Chance of isolated Strong Flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low solar activity has been observed in the past 24 hours, with a peak flare at 09/1612 UTC from the AR3912 sunspot region in the southwest.

There are currently six sunspot regions on the disc with the small AR3921 numbered. Further analysis of AR3912 is unlikely due to the lack of high resolution imagery, particularly as it is starting its approach towards the western limb. AR3917 continues to be the most magnetically complex on the Earth-facing disc. AR3916 appears fairly small and straightforward, with the trailing spots beginning to fade. Other regions appear small and simple at the present time.

No Earth directed Coronal Mass Ejections (CMEs) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds increased from slightly-elevated levels, around 420 km/s, to become slight-elevated to elevated 480-520km/s through much of the period, with a brief maximum wind speed of around 550km/s around 09/0700 UTC. The Interplanetary Magnetic Field (Bt) was initially moderate but saw a steady reduction from 09/1200UTC, falling to generally weak levels. The important north-south component (Bz) has been mainly weakly negative. Quiet to Unsettled geomagnetic activity with an Active interval between 09/0000-09/0300 UTC.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: A chance of Moderate class flares, with a slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: No Earth directed CMEs are currently expected. Solar wind conditions are expected to remain elevated at times through Day 1 (10 Dec) before an expected reduction in speeds into Day 2 (11 Dec) as the ongoing connection to a faster solar wind stream looks to become increasingly weak, with solar winds expected to return towards background or slightly elevated levels through the remainder of the period.

Overall Quiet to Unsettled (Kp1-3) geomagnetic conditions are expected through the period, with a likelihood of isolated Active (Kp4) intervals and a slight chance of a G1/Minor Storm through Day 1

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(10 Dec) and into Day 2 (11 Dec).

Energetic Particles / Solar Radiation: There is a slight chance of solar radiation rising above the S1/Minor Radiation Storm threshold following any significant flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	40	40	40	40
Very Active	R3-R5 (X Class)	No	10	10	5	5

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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